Safety and Building Division Heating, Ventilating and Air-Conditioning (HVAC) Plan Submittals

Note: The Wisconsin Commercial Building Code allows for the submission of HVAC plans at a later date than the building plan submission, and by a different designer. However, it is extremely important that the HVAC designer coordinate their plan submission with the building plans. This checklist will help provide that coordination. Failure to follow these procedures can result in delay of the plan approval and possibly additional plan review fees. If possible, the HVAC plan approval application form should included the transaction I.D. number of the building plans under the heading: *"Previous Related Transaction I.D."*

A. Floor Plan

1. Corresponds to approved building plans, including Interior Layout, Room Names and Uses, Wall and Roof Insulation R-Values, Door and Fenestration R-Values.
2. Location, volume, and/or rates in CFM of exhaust, outdoor air, and combustion air
3. Location of equipment, fire dampers, fire wraps, kitchen hood exhaust duct, grease duct enclosures, and suppression systems.
4. HVAC distribution via ductwork
5. Metal duct gauge, geometry (round, square, rectangular)
6. Flexible duct diameter, specification
7. Flexible connector diameter, length limitations
8. Underground duct construction, materials, vapor barriers, insulation, clearances
9. Duct sealing requirements stated

B. Sections or Details

1. Insulation, type, R-value labeling required on plans and in the field
2. Pipe
3. Exhaust rates in CFM
4. Hood construction
5. Plenum material and location
6. Air transfer to hallways only as allowed by code
7. Clothes dryer exhaust duct distribution
8. Metal duct gauge, geometry, means of fastening, maximum length
9. Transition duct limitations and requirements

C. Equipment Information

1. Schedules, plan references, associated air movement rates in CFM
2. Indicate passed ASTM/UL/NFPA/ANSI standards referenced in code(s)
3. Operation and controls
4. Installation of Economizer indicated if required and part of installation
5. Installation of Make-up air
6. Platform and clearance locations for rooftop equipment defined
7. Guardrail location and dimensions for roof equipment as required by code
8. Condensate disposal
9. Smoke detection system (if required)
10. Smoke detector locations, model defined, installation defined
11. Control panel location, model defined
12. Smoke control system (if required)
13. Apparatus used (based on submitted calculations)
14. Control panel location

D. Calculations

1. Room by room heat loss calculations
2. Heat gain calculations may be done by area served by appliance (if AC provided)
3. Transmission plus greater of infiltration or ventilation (furnace sizing)
4. Volume of exhaust and outdoor air intake
5. Minimum combustion air requirements
6. Smoke control system sizing

E. Occupancy or "Use" Ventilation Requirements

1. See Comm 64.0403

F. Minimum Clearances

1. Outside air intakes to property lines
2. Distance intake to exhaust ventilation
3. Overhead clearances (suspended appliance)
4. Location of intakes above ground/roof

G. Combustion Air

1. Define if "unusually tight" design
2. Define infiltration versus outside air use
3. Location of openings and/or ducts
4. Size of ducts and louvers or grills

H. Balancing Manual is Required on Site

I. Maintenance Manual is Required to be Provided to Owner

Other Miscellaneous Plan Submittals

A. Sprinkler system and/or fire alarm system plans may also be required to be submitted, see separate checklist and thresholds.

B. Plumbing plan submittals may be required; see Wisconsin Plumbing Code, Comm 81-87.

C. Private On-Site Wastewater Treatments Systems (POWTS) plan submittals may be required; see Wisconsin Plumbing Code, Comm 83.

D. Elevator and escalator plan submittals may be required; see Wisconsin Elevator Code, Comm 18. See S&B website for further information.

E. Swimming pool plan submittals may be required; see Wisconsin Swimming Pool Code ,Comm 90.

F. Boiler plans require a separate submission; see Wisconsin Boiler Code, Comm 41-42.

G. Hospital and Nursing Home building and HVAC plans are not reviewed by Safety and Buildings. The Department of Health and Family Services reviews plans for these facilities. Call 608-267-1442 for further information.

HVAC Equipment replacement

1. **Equipment "replacement"** is a removal of existing, and the installation of new heating, ventilating, or air conditioning equipment with no changes to existing ductwork or piping other than as necessary to fit the new equipment to the existing system. "Replacement" does not include changing equipment sizes or capacities to accommodate building alterations or additions. Substantial changes to ductwork or piping and changes to HVAC equipment sizes or output capacities due to a building addition or alteration will require HVAC alteration plan to be submitted in accordance with section Comm 61.31.
2. **"One-for-one" HVAC/ boiler/ refrigeration equipment replacements** do **not** need to be submitted for review, but must comply with Comm 61-65. However, for boilers and refrigeration units all owners/designers are required to file Form SBD-6314 with the S&B Inspection Support Unit. Those forms may be obtained from the S&B WebSite, http://www.commerce.state.wi.us/SB/SB-Forms.html#Boilers.
3. Although submission to the state is not required, **local ordinances** may require HVAC equipment information to be submitted prior issuing HVAC permits. Any fees associated with local HVAC permits would be defined by the municipality issuing the permit.
4. **Replacement of equipment (similar in size or greater):** No state fee or submittal required. Register any boiler/refrigeration replacements with the S&B Inspection Unit (as noted above).
5. **Replacement of equipment (substantially smaller in size):** Submittal is required. "Substantially" means that the output of the new equipment is greater than 15 percent less than the original equipment. Submittal shall include:
   a. A completed SBD-118 plan application form;
   b. Appropriate fees, $200 per piece of equipment;
   c. At least four copies of a letter giving the make, model, and BTU output of the equipment being replaced; the make, model, and BTU output of the replacement equipment; and specific UL, AGA, PFS or other recognized laboratory approval;
   d. Since the BTU output of the replacement equipment is substantially less than that of the equipment being replaced, HVAC heat loss calculations must be submitted proving the adequacy and code compliance of the smaller unit(s);
   e. If the building contains 50,000 cubic feet total volume or more, the letters and calculations must be signed, sealed, and dated by a Wisconsin registered architect or engineer or HVAC designer. Boiler/refrigeration replacements need to be registered with S&B at $200 per piece of equipment.
6. **Heating ONLY** equipment is **replaced with** equipment capable of **both heating and cooling:** then plan submittal is required. Fee will be based on area to be served by equipment, plus plan submittal fee. Boiler/refrigeration replacements are required to contact the S&B Inspection Unit.
7. **Installation of stand-alone equipment** (fireplaces, range hoods, waste oil burners, etc.): submittal is required. Fees are $200/piece of equipment, plus $100 plan submittal fee.
8. In all cases involving new equipment, if the new equipment will require fire-rated isolation from the balance of the building where the old equipment did not, evidence of a rated enclosure must be submitted. Typical examples of this type of replacement include changing: from electric or else from direct-vent sealed combustion chamber gas-fired to over 400 MBH traditional gas-fired. Evidence of rated enclosure consists of a letter from an architect, engineer, or certified commercial building inspector stating there is an existing rated room and giving the fire rating of that room in hours. If the room is not adequate, submission must include the building of a new rated room, per Comm 61.31.
9. The HVAC Designer is reminded that it is their responsibility to <u>verify the existing structure to determine if it can carry the loads of the new equipment</u>. This may require working with an Architect or Structural Engineer to analyze the existing structural capacity. If revisions are required to the existing structure in order to carry new equipment loads, those alterations must be submitted to the division for review.